



2012
MRS
FALL
MEETING
November 25-30, 2012
Boston, MA

CALL FOR PAPERS

Abstract Deadline: June 19, 2012
www.mrs.org/fall2012

REMINDER: In fairness to all potential authors, late abstracts will not be accepted.

MRS Symposium PP: Frontiers of Chemical Imaging—Integrating Electrons, Photons, and Ions

Direct imaging and spectroscopy are powerful means to develop an atomistic understanding of scientific issues associated with knowledge gaps and problems in energy, environment, and national security. For example, identification of mechanisms associated with chemical, material, and biological transformations requires the direct observation of structural and chemical process that happens at atomic scale. It has been generally realized that any single imaging and spectroscopic method can only yield a small subset of available information. In many cases, a thorough understanding of materials' behavior relies on collective information captured with different imaging and spectroscopy methods, which normally correspond to different spatial, energy, and temporal resolutions. Therefore, one of the great challenges for the scientific community is to find paths that can uniquely integrate results from multiple imaging and spectroscopy capabilities to analyze a specific region within the same sample without modifying it. Although there are certain degrees of success in understanding fundamental physical, chemical, and biological processes, the ability to obtain *in-situ* data in complex processes continues to pose challenges. Advances in chemical imaging will hold the potential for fundamental breakthroughs in understanding the mechanisms involved in these processes, which in turn will guide the designing and discovering of new materials.

The purpose of this symposium is to bring together scientists and engineers working in the field of imaging using electrons, photons, and ions to discuss the frontier of the integrated chemical imaging across different platforms. The symposium will showcase the revelation of atomic- and molecular-level building blocks through multimodal chemical imaging capabilities. Interdisciplinary topics related to dynamic imaging and spectroscopy of nanostructured materials, catalytic process, and energy harvesting and storage will be highlighted.

Session topics will include:

- Frontiers in chemical imaging and analysis using electrons, photons, and ions
- *In situ* imaging and spectroscopy in catalysis and energy harvesting and storage materials
- Imaging beyond normal conditions, which include, but are not limited to, liquid, gas, high-pressure, and high-temperature environment
- Phenomena across the boundary of soft and hard materials
- New instruments and data visualization, analysis, and modeling tools for chemical imaging

Invited speakers include:

Larry Allard (Oak Ridge National Lab), **Joy Andrews Hayter** (Stanford Synchrotron Radiation Lightsource), **Simon Bare** (UOP/Honeywell), **Raphaëlle Dianoux** (Nanoscan, Switzerland), **Peter Fischer** (Lawrence Berkeley National Lab), **Brian Gorman** (Colorado School of Mines), **Wayne D. Kaplan** (Technion-Israel Inst. of Technology, Israel), **Scott Lea** (Pacific Northwest National Lab), **David Muller** (Cornell Univ.), **Markus Raschke** (Univ. of Colorado), **Peter Schattschneider** (Vienna Univ. of Technology, Austria), **Eric Stach** (Brookhaven National Lab), **Louis Terminello** (Pacific Northwest National Lab).

Symposium Organizers

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